

COVID-19 Containment Policy Measures and their Effect on Access to HIV Services for Persons Living With HIV in Ruaraka Sub-County, Kenya

Purity Jerop Chirchir^{1*}, Makobu Kimani² and Consolata M'Mayi²

¹*Ministry of Defence, P.O. Box 40668-00100, Nairobi*

²*Kenya Methodist University, P.O. Box 45240-00100, Nairobi, Kenya*

*Correspondence email: puritychirchir@gmail.com

Abstract

The spread of the novel coronavirus disease in 2019 (COVID-19) worldwide led to the introduction of mitigation and containment responses designed to stem the heightened transmission of the virus. These measures hindered face-to-face provision of healthcare, which has traditionally formed the foundation for HIV treatment, testing, and prevention services. Although the containment policy guidelines might have been effective in limiting infections, they had serious economic ramifications, which indirectly caused fear and anxiety among people living with HIV (PLHIV). Accordingly, this study assessed the effect of COVID-19 containment measures on access to HIV services for persons living with HIV. Further, the study explored the impact of these measures on the psychological health of PLHIV, including their knowledge on the virus and the coping strategies they adopted to enable them access HIV services amidst COVID-19. The study adopted a cross-sectional research design and targeted a population of 914 respondents, out of which 298 respondents constituted the sample size. Proportionate stratified and systematic random sampling approaches were used to select respondents, while a questionnaire was used to collect data. The study used a self-reported questionnaire (SRQ-20) to screen for existence of psychological distress. The Statistical Package for Social Sciences was used to analyze the data using both descriptive and inferential statistics. The findings established that COVID-19 containment guidelines, such as stay at home requirement, hindered access to HIV services. The study concluded that the outcomes of these guidelines contributed to psychological distress; coping strategies used by PLHIV to enable them access HIV services did not completely mitigate against the limited access; and people living with HIV had knowledge of the symptoms and high risk factors of COVID-19. The study recommends the Ministry of Health to integrate digital health into the delivery platforms of HIV services.

Keywords: *COVID- 19 containment policy measures, psychological distress, coping strategies, COVID-19 knowledge*

IJPP 10 (3), 72-87

1.0 Introduction

There have been coordinated and concerted efforts across the globe by various institutions, governments, communities, and health professionals to stem the increasing cases of COVID-19, and alleviate the challenges it causes in the society. However, cases and deaths associated with COVID-19 increased considerably after COVID-19 was confirmed as a pandemic on March 2020 by the World Health Organization (WHO), with the first case initially reported on 8 December 2019 in Wuhan, China (Amimo et al., 2020). While about 97–99 percent of people infected with COVID-19 recover, some cases require hospitalization, and people over 65, and those with some underlying medical conditions like diabetes, asthma, cancer, and chronic lung disease, experience higher mortality (Sun et al., 2020; World Health Organization [WHO], 2020).

“PLHIV are vulnerable to mental health problems, such as post-traumatic stress disorder, anxiety, and depression, which were further compounded by COVID-19 lockdown guidelines”

People living with HIV in China where the first case of the epidemic was reported faced precarious barriers and difficulties while ideal healthcare outcomes (Ambelu et al., 2021). The situation is replicated in other parts of the world, where COVID-19 has already aggravated the underlying barriers to

access HIV related services, such as community stigma and discrimination, user fees, and lack of supportive work environments. Prior to the outbreak of this pandemic, PLHIV were previously affected by increased levels of stigma associated with HIV, suboptimal adherence, and psychological distress, manifest in anxiety and depression (Sun et al., 2020). Gains made on provision of health services, particularly those of HIV prevention and treatment, face a risk of being reversed following the advent of COVID-19 (WHO & UNAIDS, 2020).

To illustrate this, Aborode et al. (2022) indicate that access to health facilities for those with medical appointments was impossible during lockdowns; which was a negative health consequence for people living with HIV who relied on constant ART treatment. PLHIV are vulnerable to mental health problems, such as post-traumatic stress disorder, anxiety, and depression, which are further compounded by COVID-19 lockdown guidelines (Friese et al., 2020). Existing literature demonstrates that mitigation responses against the spread of COVID-19 pandemic resulted to continued stigma, limited access to treatment, and job loss (Semo & Frissa, 2020).

Grimsrud and Wilkinson (2021) indicated that the fear associated with COVID-19 pandemic led to harmful mental health outcomes among people living with HIV. The structural and medical vulnerabilities, such as lack of insurance and HIV testing, which have in the past weakened system-and

individual-level prevention of HIV became bare at the onset of the COVID-19 pandemic (Pinto & Park, 2020).

Emerging evidence indicates that stringent lockdown guidelines led to disruption in provision of HIV services. For instance, Adugna et al. (2021) posit that HIV tests in Zambia reduced by 35% in the lockdown period. Interruptions in major supply chains, reporting systems, and logistics for HIV commodities slowed down provision of a wide range of HIV services. The advent of the COVID-19 pandemic meant that the much-needed and well-timed care for HIV was delayed since most hospitals were responding to patients infected with the coronavirus. In this context, individuals newly infected with the HIV virus had difficulty initiating antiretroviral therapy (ART) in health facilities. Further, available resources were entirely allocated to the control of COVID-19 by most of the public hospitals and other facilities (Guo et al., 2020; Jiang et al., 2020).

Most PLHIV seeking antiretroviral therapy (ART) services choose to register at public healthcare facilities that were far from their areas of residence owing to the existence of both internal and external stigma (Amimo et al., 2020). In effect, strategies, such as cessation of movement, adopted by the Kenyan government to stem the infection rates of COVID-19 culminated in reduced number of individuals accessing antiretroviral drugs. Moreover, PLHIV were hesitant to seek healthcare services for fear of contracting COVID-19 since individuals with HIV who have a compromised immune

system, as well as those with underlying medical conditions, such as cardiomyopathy and diabetes, are more susceptible to this illness. Beginning the month of March 2020, there was a shift to COVID-19 units from primary care at the hospital level by the medical personnel. Further, COVID -19 prompted reduction in hours by medical offices and closure of some agencies, such as community-based organizations (CBOs), which directly provided HIV services (Chowdhury & Oommen, 2020; Pinto & Park, 2020). Accordingly, this study sought to examine COVID- 19 containment policy measures and their effect on access to HIV services for persons living with HIV.

2.0 Materials and Methods

The study was carried out in Ruaraka Sub-County within Nairobi County, Kenya. It focused on challenges that PLHIV encountered while receiving HIV treatment services from Comprehensive Care Centers (CCC) in public health facilities. The target population constituted 914 people living with HIV, enrolled in 7 comprehensive care centers in Ruaraka Sub-County. The sampled respondents had been residents in Ruaraka Sub-County for at least six months, and were aged 18 years and above. The study adopted cross-sectional research design, which was both descriptive and analytical. The cross-sectional design was relevant in this study since it encompassed data collection at a specific periods from one or more populations with the aim of describing the existing attributes of a sample. The study applied Fischer's formula in the determining the sample size; hence,

$$n = \frac{z^2 pq}{e^2}$$

Where: n= sample size, p=the proportion in the target population estimated to have characteristics being measured, q = (1-p) e = margin of error, z = 95 percent certain

Based on the above Fischer’s formula, the sample size below is obtained;

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} = 384$$

Given that the total target population is less than 10,000, the researcher further applied

the finite correction formulae to determine the sample size as shown below:

$$n = \frac{n_o}{1 + \frac{(n_o - 1)}{N}}$$

Where; n = minimum sample size after the adjustment, n_o = minimum sample size, N = total population, i.e. 914.

$$= \frac{384}{1 + \frac{(384 - 1)}{914}} = 271$$

A non-response rate of 10 percent was added to make the total sample size 298. The sample size was spread proportionately across the health facilities as shown in Table 1.

Table 1

Sample Size

HIV Comprehensive Care Centres	Target Population	Proportion	Sample Size
Mathare North Health Centre	154	17	50
Babadogo Health Centre	203	22	66
Korogocho Health Centre	146	16	48
National Youth Service (NYS) Headquarter Dispensary	106	12	35
General Service Unit (GSU) Headquarter Dispensary	138	15	45
Ruaraka Clinic	58	6	19
CID Headquarter Dispensary	109	12	36
Total	914	100	298

Ruaraka Sub-County public health facilities were purposely selected since people living with HIV were enrolled in centers for comprehensive HIV treatment. Proportionate stratified sampling method was utilized in the recruitment of respondents based on the size of the population, where the researcher selected a predetermined number of PLHIV in each of the health facilities identified in

Table 1. Systematic random sampling was undertaken to select PLHIV in each of the health facilities. The first respondent was selected by lottery method using a sampling frame of people living with HIV per health facility, while subsequent selection of study respondents was done using systematic random sampling in every sampling fraction (k=3).

Questionnaire was used to collect data. The questionnaire allowed the researcher the convenience to administer it within a shorter time, and the respondents the opportunity to respond to the areas explored in the study. The questionnaire was subjected to pretesting to ensure its language, wording, and content was appropriate and relevant. To pretest the questionnaire, 15 respondents from Mathare North Health Centre filled the questionnaire and the outcome contributed to reliability and validity of the research tool, which ensured that it provided information appropriate for the study. 243 out of 298 questionnaires were filled and returned.

Psychological distress was evaluated by use of interviewer-based self-reported questionnaire (SRQ-20), a tool developed and recommended by WHO in screening for existence of psychiatric disturbances. Questions in the SRQ are binary in nature where a respondent can choose either Yes or No. A No response receives a zero point, while a Yes answer scores one point with the total score being 20. A score equal to or greater than 11 implies that a person suffers from psychological distress. Based on the SRQ results, 80 percent (n=194) of the respondents had a score of less than 11, whereas 20 percent (n=49) of the respondents

had scores equal to or greater than 11. The researcher obtained approval from the Kenya Methodist University Scientific and Ethical Review Committee (SERC) and National Commission for Science, Technology and Innovation (NACOSTI) upon fulfillment of all the requirements.

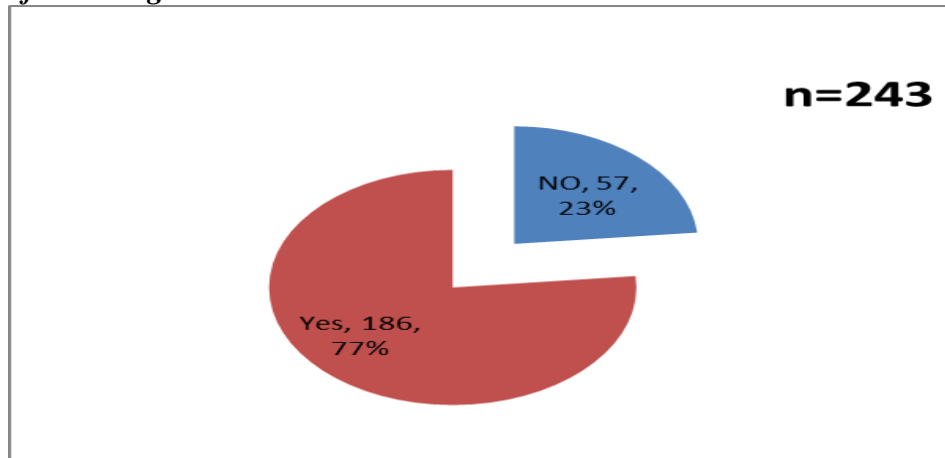
The Statistical Package for Social Sciences (SPSS version 23) was used to analyze quantitative using descriptive statistics like mean, frequencies, and percentage; while binary logistic regression was used for multivariate analysis to identify factors associated with psychological distress among PLHIV. Tables and figures were used in the presentation of the data.

3.0 Results and Discussions

Impact of COVID-19 containment policy measures on access to HIV services for persons living with HIV

Respondents were required to state whether they had experienced any challenges or difficulties in accessing HIV services since the outbreak of the COVID-19 pandemic in Kenya. Figure 1 below summarizes the respondents.

Figure 1
Frequency of Challenges



Based on the results of the study, majority (77 percent, n=186) of the respondents experienced challenges in accessing HIV services after the outbreak of COVID-19 in the country; with only 23 percent, (n=57) indicating that they did not face any difficulty in accessing services related to HIV treatment. A follow-up question was posed to the respondents regarding the specific COVID-19 containment policy measures that

affected their routine access to HIV services. Respondents were provided with the COVID-19 attendant policy measures, which were introduced by the Kenyan government to slow down the spread of the virus, and were expected to indicate the extent to which they disagreed or agreed with each of them to have affected their access to HIV services. The responses were measured on a Likert scale as summarized in table 2 below.

Table 2

COVID-19 Containment Policy Measures and Access to HIV Services

COVID-19 Containment Measures	Disagree		Neutral		Agree	
	Freq.	%	Freq.	%	Freq.	%
Closure of public transport	17	9.1	57	30.6	112	60.2
Cessation of movement	35	18.8	37	19.9	114	61.2
Stay at home requirement	57	30.6	15	8.1	114	61.2
Curfew	55	29.5	25	13.4	106	56.9
Public transportation limitation on passenger capacity	10	5.4	21	11.3	155	83.3
Quarantine	76	40.9	21	11.3	89	47.8
Reduction of service hours in clinics	113	60.8	37	19.9	36	19.4

From table 2, closure of public transport (60.2 percent), cessation of movement (61.2 percent), stay at home requirement (61.2 percent), curfew (56.9 percent), and public transport limitation on passenger capacity (83.3 percent) were cited by respondents as specific COVID-19 containment policy measures that affected access to various HIV-related services. These findings suggest that, to a large extent, the respondents were aware of the COVID-19 containment measures that negatively impacted access to critical services, including HIV services by PLHIV. The 2020 UNAIDS report on COVID-19 and HIV Progress noted that the COVID-19 pandemic response measures directly and indirectly affected HIV programs, worsened inequalities, and weakened human rights. HIV-related vulnerabilities increased amidst the pandemic and caused disproportionate negative impacts on middle and low-income countries where there is extreme marginalization and poverty. For instance, a study undertaken in Kenya by Muhula et al., (2021) demonstrated that there was a 56% decline in the uptake of HIV services. Moreover, the study findings showed a 48% reduction among clients initiated into ART.

These results are in agreement with recent literature and other empirical studies on COVID-19 and HIV. Jiang et al. (2020) noted that efforts that were being coordinated by governments in partnership with

communities and various global bodies presented many barriers and challenges to HIV care continuum, especially uptake of ART among people newly infected with HIV virus.

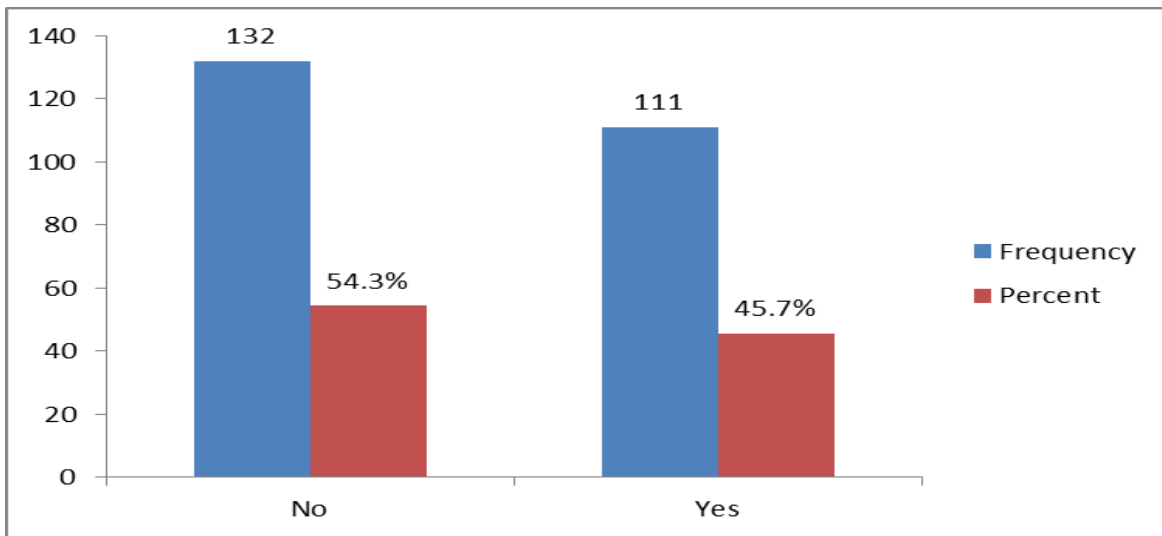
A study carried out by Pinto and Park (2020) revealed that physical distancing between clients and providers negatively affected how frequent clients were linked to HIV services by frontline workers. Amimo et al. (2020) observed that the introduction of policies to stop further spread of COVID-19 virus, such as town lockdowns, limited access to HIV services prompted by lack of means of transport to healthcare facilities, as well as the diminished capability to generate adequate income to cover medical expenses affected access to service by PLHIV. Nyoni and Okumu (2020) avers that shelter-in-place and social distancing protocols that were important for the prevention and containment of the spread of COVID-19 acted as barriers to ART treatment.

Coping strategies used by people living with HIV to enable access to HIV services under the new COVID-19 containment policy measures

Respondents were asked to state whether they experienced interrupted supply to ART after COVID-19 containment policy measures were implemented in Kenya. Figure 2 below presents the results obtained.

Figure 2

Interrupted supply of ART



From figure 2 above, majority (54.3 percent, n=132) of the respondents indicated that they did not experience interrupted supply of ART after the implementation of measures to stem the spread of COVID-19. Less than a half (45.7 percent, n=111) of the respondents reported that there were interruptions in the provision of ART. A follow-up question was posed to the respondents who had acknowledged that they had interruptions in

the supply of ART, regarding the strategies they used to maintain continued access to this treatment amidst the enactment of the guidelines to control the heightened spread of COVID-19. Respondents were provided with a wide range of strategies that PLHIV can possibly use to ensure that they access ART whenever they experience interruptions. Results are tabulated in table 3 below.

Table 3

Coping Strategies

Statements on coping strategies	f	%
Refill antiretroviral drugs at the nearest clinics	41	19.2
Maintain enrolment at the present treatment centre to continue ART	50	23.5
Maintain 3-6 months doses to reduce clinic visits	91	42.7
ART distribution through community-based delivery	31	14.6

Based on the results detailed in table 2, some respondents indicated that they refilled antiretroviral drugs at the nearest clinic, maintained enrolment at their treatment centres to continue ART, maintained 3-6 months doses to reduce clinic, and relied on ART distribution through community-based delivery. These findings suggest that the actors involved in providing access to ARTs together with PLHIV responded quickly to the changes occasioned by the pandemic to avert a potential crisis following the enforcement of COVID-19 containment measures.

These findings corroborate that of Prabhu et al. (2020) who posited that several countries were adversely affected by COVID-19 as regards delivery of HIV care, despite being offered opportunities to accelerate operational strategies, such as multi-month ART. This compares favorably with efforts put in place by the Ministry of Health in Kenya, where differentiated service delivery guidelines were issued so that people on ART were eligible for 3-multi-month dispensing (3-MMD) regardless of their viral load. Similarly, 3-MMD approach was also advocated in other African countries, such as Ethiopia, Liberia, and Cote d'Ivoire.

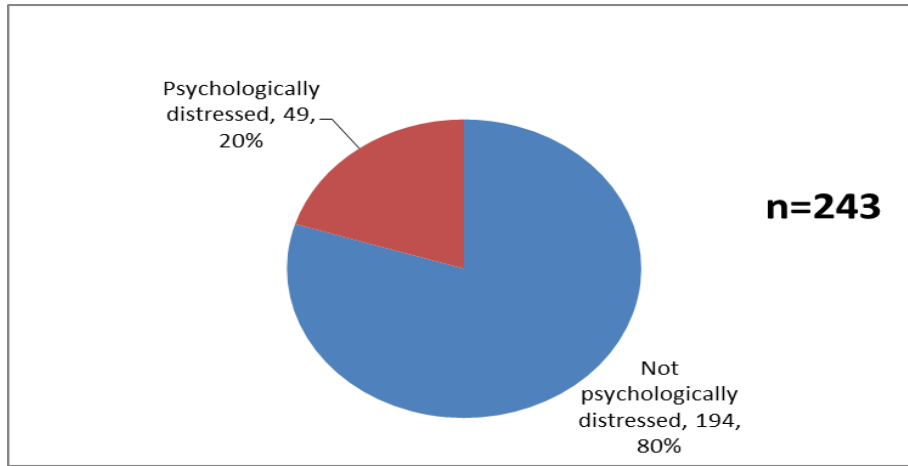
Impact of COVID-19 Containment Policy Measures on Psychological Distress among People Living With HIV

An interviewer-based self-reported questionnaire (SRQ-20) was used to determine presence of psychological distress among the respondents. Questions in the SRQ were binary in nature wherein respondents were expected to choose either Yes or No. A No response received a zero point, while a Yes answer scored one point with the total score being 20. A score equal to or greater than 11 implies that a person suffers from psychological distress.

Based on the computations from the interviewer-based self-reported questionnaire (SRQ-20) as presented in figure 3 below, 80 percent (n=194) of the respondents had a score of less than 11, while 20 percent (n=49) of the respondents had scores equal to or greater than 11. This signals presence of psychological distress. In effect, the prevalence of psychological distress based on the sample size of the study was 20.2% (95% CI: 15.2%, 25.1%). The prevalence of psychological distress was estimated from the number of respondents who experienced psychological distress (n=49) divided by the sample size (based on the response rate) of the study from which data was collected (n=243).

Figure 3

Psychological Distress



The study also investigated the intersection between outcomes of COVID-19 containment policy measures and psychological distress. In this sub-section, respondents were provided with various outcomes of COVID-19 containment policy

measures and were required to indicate the extent to which each of them might have contributed to psychological distress that they were experiencing. The results are collated in table 4.

Table 4

Outcomes of COVID-19 Containment Policy Measures and Psychological Distress

Psychological Distress	Disagree		Neutral		Agree	
	Freq.	%	Freq.	%	Freq.	%
Disrupted HIV continuum of care	38	15.6	71	29.2	134	55.2
Diminished resources and ability to generate income	49	20.2	8	3.3	186	76.6
Closure of organization providing HIV services	133	54.8	46	18.9	64	26.3
Job loss	1	0.4	4	1.6	238	98
Closure of opportunities in the non-formal education	32	13.2	70	28.8	141	58

The results in table 4 suggest that disruptions on the continuum of HIV services substantially resulted in psychological distress to PLHIV. This finding further evinced that other outcomes of COVID-19

containment policy guidelines, such as closure of organizations providing HIV services and job loss, contributed to psychological distress that PLHIV experienced. The finding further indicated

that despite stay-at-home orders and workplace closures being effective in limiting infections, they had serious economic ramifications, which indirectly caused fear and anxiety (Ambelu et al., 2021).

While the pandemic affected every aspect of human life, Aborode et al. (2022) notes that the containment policy and mitigation measures disproportionately affected the economic wellbeing of populations considered as vulnerable, including people living with HIV. The COVID-19 pandemic

affected PLHIV since containment guidelines led to stigma, job loss, and diminished access to treatment (Grimsrud & Wilkinson, 2021).

Multivariate logistic regression analysis was used to determine factors associated with psychological distress among people living with HIV; namely, being either male or female (gender), living with family (living condition), illiterate (education status), married (marital status). The findings are presented in Table 5;

Table 5

Results of Multivariate Logistic Regression

Variable	P-Value	Adjusted Odds Ratio (AOR)	95% Confidence Interval (CI)
Gender (1)	0.00	1.822	1.05-5.62
Living Condition(1)	0.00	2.302	1.01-5.13
Education Status (1)	0.00	1.585	0.81-2.91
Marital Status (1)	0.39	.957	0.65-1.78
Access to HIV Services (1)	0.00	0.884	0.08-0.72

Results from the multivariate logistic regression analysis showed that being female, illiterate, living alone, and experiencing challenges in accessing HIV services amidst the COVID-19 pandemic were statistically and significantly associated with psychological distress ($p < 0.05$). Being married was associated with psychological distress, but the relationship was not statistically significant ($p > 0.05$). Ho et al. (2020) state that living alone due to social isolation is more likely to lead to mental health problems, especially among the

elderly, while Cunha et al. (2017) indicate that literate people are knowledgeable about the factors associated with high risk of the HIV virus, including possessing significant levels of health literacy on their HIV condition, and the strategies they can apply to improve adherence to health guidance. The social control responses, such as lockdowns and physical distancing, caused immediate effects like stress, anxiety, loneliness, and social isolation, while at the same time posing long-term effects, like PTSD and depression. The intersecting stressors;

namely, environmental, social, economic, familial, biomedical, and psychological, have so far overwhelmed people living with HIV (Okumu et al., 2021).

COVID-19 Knowledge among People Living With HIV

The study investigated the respondents’ knowledge on symptoms of COVID-19. Table 6 tabulates the results.

Table 6

Knowledge on Symptoms of COVID-19

Symptoms	False		True	
	Freq.	%	Freq.	%
Fever or chills	6	2.5	237	97.5
Cough	5	2.1	238	97.9
Shortness of breath or difficulty breathing	8	3.3	235	96.7
Fatigue	9	3.7	234	96.3
New loss of taste or smell	8	3.3	235	96.7
Headache	4	1.6	239	98.4
Muscle or body aches	3	1.2	240	98.8
Sore throat	3	1.2	240	98.8
Congestion or runny nose	9	3.7	234	96.3
Diarrhea	41	16.9	202	83.1
Nausea or vomiting	33	13.6	210	86.4

Results presented in table 6 revealed that majority of the respondents indicated that fever and chills ((97.5 percent, n=237), cough (97.9 percent, n=238), shortness of breath or difficulty in breathing (96.7 percent, n=235), fatigue (96.3 percent, n=234), loss of taste or smell (96.7 percent, n=235), and headache (98.5 percent, n=239) symptomized the COVID-19 virus. In addition, body aches (98.8 percent, n=240), sore throat (98.8 percent, n=240) congestion or runny nose (96.3 percent, n=234) diarrhea (83.1 percent, n=202) nausea or vomiting (86.4 percent, n=210) were identified by respondents as

symptoms of COVID-19. The government of Kenya through the Ministry of Health (MoH) has been at the forefront in disseminating important information on the symptoms associated with COVID-19 and thus, the knowledge of PLHIV on COVID-19 can be attributed to the guidelines provided by the ministry.

The study also sought to establish knowledge of people living with HIV on various risk factors associated with high risk of COVID-19. Table 7 summarizes the findings.

Table 7

Knowledge on COVID-19 Risk Factors

Risk Factors	Disagree		Neutral		Agree	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Older age	0	0.0	0	0.0	243	100.0
Pre-existing cardiovascular diseases	0	0.0	15	6.2	228	93.8
Poverty and crowding	95	39.0	32	13.2	116	47.7
Pregnancy	111	45.7	82	33.7	50	20.6
Physical inactivity	170	70.0	24	9.9	49	20.2
Air pollution	124	51.0	22	9.1	97	39.9
Respiratory Disease	10	4.2	100	41.2	133	54.7
Alcohol and smoking	109	44.9	92	37.9	42	17.3

According to the results contained in table 6, existing cardiovascular diseases, old age, and respiratory diseases were rightfully indicated by respondents as key risk factors associated with COVID-19. According to the guidelines on case management of COVID-19 provided by the Kenyan government through the Ministry of Health, up to 30% of patients who had severe COVID-19 had existing poorly controlled comorbidities, the most common being chronic lung disease, asthma, hypertension, HIV, diabetes mellitus, and cardiovascular diseases (MoH, 2021). Patients with diabetes are at a higher risk of contracting COVID-19 if they are suffering from other underlying conditions, such as kidney disease, chronic obstructive pulmonary disease, hypertension, and heart failure.

4.0 Conclusion

The study concluded that COVID-19 containment policy measures, such as closure of public transport, cessation of movement, and curfew were some of the containment

policy and mitigation responses that negatively affected access to HIV services by people living with HIV. The study also concluded that refill of antiretroviral drugs at the nearest clinics, maintaining enrolment in the current treatment centre to continue ART, maintaining 3-6 months’ doses to reduce clinic visits, and ART distribution through community-based delivery were some of the coping strategies used by PLHIV to enable access to HIV services under the new COVID-19 containment policy measures. However, they did not mitigate completely the limited access.

Disrupted HIV continuum of care, diminished resources and inability to generate income, closure of organizations providing HIV services, job loss, and closure of opportunities, significantly contributed to psychological distress experienced by PLHIV. In addition, the study concluded that PLHIV had knowledge of the symptoms and factors associated with high risk of COVID-19.

5.0 Recommendations

The study recommends that enhanced investment in telemedicine in counselling be made available to PLHIV who are unable to travel to health facilities amidst the strict enforcement of the COVID-19 containment policy and mitigation measures to help them receive psychological counselling remotely. Further, the study recommends that the

Ministry of Health together with other actors devise innovative service delivery channels, such as multi-month dispensing of ART, mailing, and home delivery approach, to ensure uninterrupted access to ART. It also recommended continued COVID-19 sensitization campaigns by the Government since the symptoms keep on changing due to the evolving nature of the virus' strains.

References

- Aborode, A. T., Olotu, T. M., Oyetunde, O. B., Ajagbe, A. O., Mustapha, M. A., Karra-Aly, A., & Oko, C. I. (2022). COVID-19 outcomes in HIV patients: A review. *Annals of medicine and surgery (2012)*, 78, 103768. <https://doi.org/10.1016/j.amsu.2022.103768>
- Adugna, A., Azanaw, J., & Melaku, M. S. (2021). The Effect of COVID-19 on Routine HIV Care Services from Health Facilities in Northwest Ethiopia. *HIV/AIDS (Auckland, NZ)*, 13, 1159. <https://doi.org/10.2147%2FHIV.S341012>
- Aluga, M. A. (2020). Coronavirus Disease 2019 (COVID-19) in Kenya: Preparedness, response and transmissibility. *Journal of Microbiology, Immunology and Infection*, 3(5), 671-673. <https://doi.org/10.1016/j.jmii.2020.04.011>
- Ambelu, A., Birhanu, Z., Yitayih, Y., Kebede, Y., Mecha, M., Abafita, J., Belay, A. & Fufa, D. (2021). Psychological distress during the COVID-19 pandemic in Ethiopia: an online cross-sectional study to identify the need for equal attention of intervention. *Annals of general psychiatry*, 20(1), 1-10. <https://doi.org/10.1186/s12991-021-00344-4>
- Amimo, F., Lambert, B., & Magit, A. (2020). What does the COVID-19 pandemic mean for HIV, tuberculosis, and malaria control? *Tropical Medicine and Health*, 48(1), 1-4. <https://doi.org/10.1186/s41182-020-00219-6>
- Chowdhury, S. D., & Oommen, A. M. (2020). Epidemiology of COVID-19. *Journal of Digestive Endoscopy*, 11(01), 03-07. <https://doi.org/10.1055/s-0040-1712187>

- Cunha, G. H. D., Galvão, M. T. G., Pinheiro, P. N. D. C., & Vieira, N. F. C. (2017). Health literacy for people living with HIV/Aids: An integrative review. *Revista Brasileira de Enfermagem*, 70(1), 180-188. <https://doi.org/10.1590/0034-7167-2015-0052>
- Friese, C. R., Veenema, T. G., Johnson, J. S., Jayaraman, S., Chang, J. C., & Clever, L. H. (2020). Respiratory protection considerations for healthcare workers during the COVID-19 Pandemic. *Health security*, 18(3), 237-240. <https://doi.org/10.1089/hs.2020.0036>
- Grimsrud, A., & Wilkinson, L. (2021). Acceleration of differentiated service delivery for HIV treatment in sub-Saharan Africa during COVID-19. *Journal of the International AIDS Society*, 24(6), e25704. <https://doi.org/10.1002/jia2.25704>
- Guo, W., Weng, H. L., Bai, H., Liu, J., Wei, X. N., Zhou, K., & Sande, A. (2020). Quick community survey on the impact of COVID-19 outbreak for the healthcare of people living with HIV. *Zhonghua Liu Xing Bing xue za zhi= Zhonghua Liuxingbingxue Zazhi*, 41(5), 663-667. <https://doi.org/10.3760/cma.j.cn112338-20200314-00345>
- Jiang, H., Zhou, Y., & Tang, W. (2020). Maintaining HIV care during the COVID-19 pandemic. *The Lancet HIV*, 7(5), 308-309. [https://doi.org/10.1016/S2352-3018\(20\)30105-3](https://doi.org/10.1016/S2352-3018(20)30105-3)
- Joint United Nations Programme on HIV/AIDS. (2020b). *COVID-19 and HIV progress report 2020*. https://www.unaids.org/sites/default/files/media_asset/COVID-19_HIV_EN.pdf
- Ministry of Health, Kenya (2021). *Guidelines on case management of COVID-19 in Kenya*. <https://www.health.go.ke/wp-content/uploads/2021/10/Final-guidelines-on-the-Management-of-Covid-19-in-Kenya-2021-Edition.pdf>
- Muhula, S., Opanga, Y., Oramisi, V., Ngugi, C., Ngunu, C., Carter, J., ... & Memiah, P. (2021). Impact of the first wave of the COVID-19 pandemic on HIV/AIDS programming in Kenya: evidence from Kibera informal settlement and COVID-19 hotspot counties. *International Journal of Environmental Research and Public Health*, 18(11), 6009. <https://doi.org/10.3390/ijerph18116009>
- Nyoni, T., & Okumu, M. (2020). COVID-19-Compliant Strategies for Supporting Treatment Adherence Among People Living with HIV in Sub-Saharan Africa. *AIDS and Behavior*, 24(9), 2473-2476. <https://doi.org/10.1007/s10461-020-02888-0>

- Okumu, M., Nyoni, T., & Byansi, W. (2021). Alleviating psychological distress and promoting mental wellbeing among adolescents living with HIV in sub-Saharan Africa, during and after COVID-19. *Global Public Health, 16*(6), 964-973. <https://doi.org/10.1080/17441692.2021.1912137>
- Pinto, R. M., & Park, S. (2020). COVID-19 Pandemic disrupts HIV continuum of care and prevention: Implications for research and practice concerning community-based organizations and frontline providers. *AIDS and Behavior, 24*(9), 2486-2489. <https://doi.org/10.1007/s10461-020-02893-3>
- Prabhu, S., Poongulali, S., & Kumarasamy, N. (2020). Impact of COVID-19 on people with HIV: A Review. *Journal of virus eradication, 6*(4), 100019. <https://doi.org/10.1016/j.jve.2020.100019>
- Semo, B. W., & Frissa, S. M. (2020). The mental health impact of the COVID-19 pandemic: Implications for sub-Saharan Africa. *Psychology research and behavior management, 13*, 713. <https://doi.org/10.2147%2FPRBM.S264286>
- Sun, S., Hou, J., Chen, Y., Lu, Y., Brown, L., & Operario, D. (2020). Challenges to HIV care and psychological health during the COVID-19 Pandemic among people living with HIV in China. *AIDS and Behavior, 24*(10), 2764-2765. <https://dx.doi.org/10.1007%2Fs10461-020-02903-4>
- World Health Organization & Joint United Nations Programme on HIV/AIDS. (May, 2020). *The cost of inaction: COVID-19-related service disruptions could cause hundreds of thousands of extra deaths from HIV.* <https://www.who.int/news/item/11-05-2020-the-cost-of-inaction-covid-19-related-service-disruptions-could-cause-hundreds-of-thousands-of-extra-deaths-from-hiv>
- World Health Organization. (2020). *Coronavirus disease 2019 (COVID-19): Situation reports: Weekly Epidemiological Update and Weekly Operational Update.* <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>